We claim:

1. A method of processing transmit signals S_{tr} that are received over a receive channel C_{rcv} which is formed by a plurality of receive paths, the method comprising the steps of:

receiving said transmit signals S_{tr} with a plurality of spatially separated antennas to form respective receive signals S_{rcv}; and

spatially and temporally processing said receive signals S_{rcv} to form a combined corrected signal $S_{crct_{cmb}}$ that reduces errors in at least one signal parameter.

2. The method of claim 1, wherein said transmit signals Str have an average wavelength lavg and said receiving step includes the step of separating said antennas by spaces of substantially lavg/2.

3. The method of claim 1, wherein said processing step is preceded by a step of coherently downconverting and digitizing said received signals S_{rcvd}.

4. The method of claim 3, wherein said transmit signals S_{tr} carry modulated data signals and further including the step of demodulating said combined corrected signal $S_{crct_{cmb}}$ to recover said data signals.

5. The method of claim 1, wherein said signal parameter is a signal preamble.

6. The method of claim 1, wherein said signal parameter is a signal code.

7. The method of claim 1, wherein said signal parameter is a spreading code.

8. The method of claim 1, wherein said signal parameter is a signal modulation.

9. The method of claim 1, wherein said processing step includes the

step of correcting said received signals S_{rcvd} to form respective corrected signals S_{crct} that reduce errors in said signal parameter and further including the steps of:

comparing said signal parameter of at least one of said corrected signals S_{crct} to a known corresponding signal parameter to detect a difference; and

altering phase and gain of said corrected signal S_{crct} to reduce said difference below a predetermined threshold and thereby reduce the contribution of an interference signal to said combined corrected signal $S_{crct_{cmb}}$.

10. The method of claim 1, wherein said processing step includes the step of correcting said received signals S_{rcvd} to form respective corrected signals S_{crct} that reduce errors in said signal parameter and further including the steps of:

comparing said signal parameter of at least one of said corrected signals S_{crct} to a known corresponding signal parameter to detect a difference; and

inserting a canceling signal into said corrected signal S_{crct} to reduce said difference below a predetermined threshold and thereby reduce the contribution of an interference signal to said combined corrected signal $S_{crct_{cmb}}$.

11. The method of claim 1, wherein said processing step includes the steps of:

correcting said received signals S_{rcvd} to form respective corrected signals S_{crct} that reduce temporal errors in said signal parameter; and

combining said corrected signals S_{crct} to reduce spatial errors of said signal parameter in said combined corrected signal $S_{crct_{cmb}}$.

12. The method of claim 11, wherein said correcting step includes the step of equalizing said receive channel C_{rcv}.

13. The method of claim 12, wherein, for each of said received

signals S_{rcvd}, said equalizing step includes the steps of:

summing versions of that received signal S_{rcvd} that are modified with respective weights and time delays to form a corrected signal S_{crct};

comparing said signal parameter of said corrected signal S_{crct} and a known corresponding signal parameter to detect a difference; and

updating said weights and time delays to reduce said difference.

14. The method of claim 13, wherein said equalizing step further includes the step of convolving one of said received signals S_{rcvd} with a known version of said signal parameter to determine said time delays.

15. The method of claim 11, wherein said combining step includes the steps of:

providing said corrected signals S_{crct} with respective weights to form said combined corrected signal $S_{crct_{cmb}}$;

comparing said signal parameter of said combined corrected signal $S_{crct_{cmb}}$ and a known corresponding signal parameter to detect a difference; and

updating said weights to reduce said difference.

16. The method of claim 11, wherein said combining step includes the steps of:

comparing a spectrum of at least one of said corrected signals S_{crct} to a spectrum of a known corresponding signal parameter to detect a difference; and

altering phase and gain of said corrected signal S_{crct} to reduce said difference below a predetermined threshold and thereby reduce the contribution of an interference signal to said combined corrected signal $S_{crct_{cmb}}$.

17. The method of claim 1, wherein said processing step includes the steps of:

estimating said receive channel C_{rcv} to determine time delays that correspond to said receive paths;

for each determined time delay, summing corresponding received signals S_{rcvd} which are modified by respective weights to provide a respective corrected signal S_{crct} that reduces spatial errors in said signal parameter; and

with their respective time delays, combining all corrected signals S_{crct} derived in said summing step to realize said combined corrected signal $S_{crct_{cmb}}$.

18. The method of claim 17, further including the step of combining the results of said estimating step on at least two of said received signals S_{rcvd}.

19. The method of claim 17, wherein said estimating step includes the step of convolving one of said received signals S_{rcvd} with a known signal parameter that corresponds to said signal parameter of said received signals S_{rcvd} to determine said time delays.

20. The method of claim 17, wherein said estimating step includes the steps of:

summing versions of one of said received signal S_{rcvd} that have respective weights and time delays to form a test signal S_{tst};

comparing said signal parameter of said test signal S_{tst} and a known corresponding signal parameter to detect a difference; and

updating said weights and time delays to reduce said difference.

21. The method of claim 1, wherein said processing step includes the steps of:

for each of said received signals S_{rcvd}, providing signal versions of that received signal S_{rcvd} that have respective weights and time delays;

summing said signal versions of all of said received signals S_{rcvd} to form said combined corrected signal $S_{crct_{cmb}}$;

comparing said signal parameter of said combined corrected signal $S_{crct_{cmb}}$ and a known corresponding signal parameter to detect a difference; and

updating said weights and time delays to reduce said difference.

22. The method of claim 21, wherein said comparing step includes the step of convolving one of said received signals S_{rcvd} with a known version of said signal parameter to determine said time delays.

23 The method of claim 22, wherein said weights are complex coefficients.

24. The method of claim 1, wherein said receive signals S_{rcv} include signal portions that carry modulated data signals and said processing step includes the steps of:

estimating said receive channel C_{rcv} to determine time delays and respective weights for reduction of temporal errors in said signal parameter;

applying complex corrections based on of said weights to said signal portions to obtain corrected signals Scrct; and

summing said corrected signals Scrct to obtain said combined corrected signal $S_{crct_{cmb}}$.

25. A receiver system for processing transmit signals S_{tr} that are received over a receive channel C_{rcv} which is formed by a plurality of receive paths, the system comprising:

a plurality of spatially separated antennas that convert said transmit signals S_{tr} to receive signals S_{rcv};

a downconverter system that coherently downconverts said receive signals S_{rcv};

analog-to-digital converters that coherently digitize said receive signals S_{rcv};

and

at least one data processor that is programmed to execute the step of spatially and temporally processing said receive signals S_{rcv} to form a combined corrected signal $S_{crct_{cmb}}$ that reduces errors in at least one signal parameter.

26. The system of claim 25, wherein said transmit signals S_{tr} have an average wavelength λ_{avg} and antennas are separated by spaces of substantially $\lambda_{avg}/2$.

27. The system of claim 25, wherein said transmit signals S_{tr} carry modulated data signals and further including a demodulator that demodulates said combined corrected signal $S_{crct_{cmb}}$ to recover said data signals.

28. The system of claim 25, wherein said downconverter system includes:

downconverters that coherently downconvert and multiplex said receive signals S_{rcv} to different first intermediate signals;

tuners that coherently downconvert said first intermediate signals to second intermediate signals; and

a cable that couples said first intermediate signals to said tuners.

29. The system of claim 25, wherein said signal parameter is a signal preamble.

30. The system of claim 25, wherein said processing step includes the steps of:

correcting said received signals S_{rcvd} to form respective corrected signals S_{crct} that reduce temporal errors in said signal parameter; and

combining said corrected signals S_{crct} to reduce spatial errors of said signal parameter in said combined corrected signal $S_{crct_{cmb}}$.

31. The system of claim 25, wherein said processing step includes the steps of:

estimating said receive channel C_{rcv} to determine time delays that correspond to said receive paths;

for each determined time delay, summing corresponding received signals S_{rcvd} which are modified by respective weights to

provide a respective corrected signal S_{crct} that reduces spatial errors in said signal parameter; and

with their respective time delays, combining all corrected signals S_{crct} derived in said summing step to realize said combined corrected signal $S_{crct_{cmb}}$.

32. The system of claim 25, wherein said processing step includes the steps of:

for each of said received signals S_{rcvd}, providing signal versions of that received signal S_{rcvd} that have respective weights and time delays;

summing said signal versions of all of said received signals S_{rcvd} to form said combined corrected signal $S_{crct_{cmb}}$;

comparing said signal parameter of said combined corrected signal $S_{crct_{cmb}}$ and a known corresponding signal parameter to detect a difference; and

updating said weights and time delays to reduce said difference.

33. The system of claim 25, wherein said receive signals S_{rcv} include signal portions that carry modulated data signals and said processing step includes the steps of:

estimating said receive channel C_{rcv} to determine time delays and respective weights for reduction of temporal errors in said signal parameter;

applying complex conjugates of said weights to said signal portions to obtain corrected signals Scrct; and

summing said corrected signals Scrct to obtain said combined corrected signal $S_{crct_{cmb}}$.